

PATENT COOPERATION TREATY

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From the INTERNATIONAL BUREAU

NOTIFICATION OF THE RECORDING
OF A CHANGE(PCT Rule 92bis.1 and
Administrative Instructions, Section 422)

To:

HALLYBONE, Huw G.
Carpmaels & Ransford
43 Bloomsbury Square
London WC1A 2RA
ROYAUME-UNI

Date of mailing (day/month/year) 17 August 2001 (17.08.01)	IMPORTANT NOTIFICATION
Applicant's or agent's file reference SAH01457WO	
International application No. PCT/GB00/03145	International filing date (day/month/year) 15 August 2000 (15.08.00)

1. The following indications appeared on record concerning:

☐ the applicant ☐ the inventor ☒ the agent ☐ the common representative

Name and Address GILL JENNINGS & EVERY Broadgate House 7 Eldon Street London EC2M 7LH United Kingdom	State of Nationality	State of Residence
	Telephone No. 44 20 7377 1377	
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	Teleprinter No.	

2. The International Bureau hereby notifies the applicant that the following change has been recorded concerning:

☒ the person ☒ the name ☒ the address ☐ the nationality ☐ the residence

Name and Address HALLYBONE, Huw G. Carpmaels & Ransford 43 Bloomsbury Square London WC1A 2RA United Kingdom	State of Nationality	State of Residence
	Telephone No.	
	Facsimile No.	
	Teleprinter No.	

3. Further observations, if necessary:

4. A copy of this notification has been sent to:

<input checked="" type="checkbox"/> the receiving Office	<input type="checkbox"/> the designated Offices concerned
<input type="checkbox"/> the International Searching Authority	<input checked="" type="checkbox"/> the elected Offices concerned
<input checked="" type="checkbox"/> the International Preliminary Examining Authority	<input type="checkbox"/> other:

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland	Authorized officer I. Britel
Facsimile No.: (41-22) 740.14.35	Telephone No.: (41-22) 338.83.38

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(PCT Rule 61.2)

Commissioner
US Department of Commerce
United States Patent and Trademark
Office, PCT
2011 South Clark Place Room
CP2/5C24
Arlington, VA 22202
ETATS-UNIS D'AMERIQUE
in its capacity as elected Office

Date of mailing (day/month/year) 09 May 2001 (09.05.01)	ETATS-UNIS D'AMERIQUE in its capacity as elected Office
International application No. PCT/GB00/03145	Applicant's or agent's file reference SAH01457WO
International filing date (day/month/year) 15 August 2000 (15.08.00)	Priority date (day/month/year) 17 August 1999 (17.08.99)
Applicant CASSELL S. John et al	

- ☒ in the demand filed with the International Preliminary Examining Authority on:
- 05 March 2001 (05.03.01)

- ☐ in a notice effecting later election filed with the International Bureau on:

2. The election ☒ was
☐ was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

<p>The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland</p> <p>Facsimile No.: (41-22) 740.14.35</p>	<p>Authorized officer</p> <p>Pascal Piriou</p> <p>Telephone No.: (41-22) 338.83.38</p>
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(84) Designated States (*regional*): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

(72) Inventors; and

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Published:

— With international search report.

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: FLEXIBLE PIPETTE STRIP AND METHOD OF ITS USE

(57) Abstract: A method of substance sampling and dispensing. The method comprises the step of feeding a strip, on which sampling devices are mounted, from a supply reel to an aspirate/dispense head. One or more of the sampling devices is positioned ready for sampling. A sample is taken and dispensed. The used sampling device is fed to a waste container. An apparatus for performing the method is also disclosed.

WO 01/12330 A1

FLEXIBLE PIPETTE STRIP AND METHOD OF ITS USE

This invention relates to a system for manual and automated substance handling.

5 Single and multi-channel handling systems are widely used in drug discovery, medicine, biotechnology and chemistry. Both disposable and non-disposable pipettes are used, and these may be hand-held, mounted on a robot or integrated into a machine. Many such systems use pipettes.

10 Examples of pipetting systems using disposable pipette tips include hand-held single or multiple pipettors such as those manufactured by Eppendorf (Hamburg, Germany) and Gilson (Paris, France) and robot-mounted multiple pipettors such as those manufactured by Beckman Coulter Inc,
15 (Fullerton, California, USA). Disposable pipettes give the advantage that they eliminate cross-contamination from sample to sample and can also protect the user from the danger of coming into contact with infectious or hazardous substances. Whether in manual use or machine, systems
20 using disposable pipettes have to dispose of used tips and pick up new ones. With manual systems, a user may put individual tips onto the pipette by hand, but commonly fresh pipettes are picked up from a rack of tips. Pipettors are commonly used to load samples into microtitre
25 plates and the tip rack is chosen to match the pitch and layout of standard plates. Thus, tips may be arrayed in racks of 96 or 384 to match 96-well or 384-well plates.

30 With a manual pipettor, the user has to move the pipettor to a tip rack to pick up pipette tips. When the pipette has been used, the operator then ejects the tip, usually into a waste container. This process has several disadvantages. The operator is required to make additional hand movements over and above the necessary operation of pipetting a sample from one container to another, thus
35 increasing fatigue and reducing throughput. The number of tips the user can access at any one time is limited by the number of racks that can be placed within arms reach. For

very small volume devices, it is difficult for the user to align the pipettor with the new tip. As a result, pipettors for volumes of 2 microlitres or less are typically single channel devices.

5 Robotic liquid handling systems using disposable pipette tips have similar drawbacks. The speed of the cartesian robot or other automated device is limited by the need to accelerate, move and stop heavy mechanical systems from tip rack to sample and then to waste. The number of
10 liquid handling steps that can be performed in a single batch is limited by the number of tip racks that can be placed within reach of the robot. The precisional accuracy required to align sub-microlitre pipette tips has precluded the use of such devices in large arrays. Another
15 disadvantage is the cost of the racks used to support the tips.

 An alternative approach is the use of non-disposable devices, singly or in arrays. Examples of single hand-held devices are the precision syringes for low volume liquid
20 handling manufactured by Hamilton and SGE. The barrel is typically made of glass and the syringe is made of metal, sometimes with a plastic or elastomeric piston seal. Being precision devices made of expensive materials these syringes are too expensive to be disposable. Several
25 manufacturers, most notably Robbins Scientific (Sunnyvale, California, USA) and Tomtec (Hamden, Connecticut, USA) manufacture liquid handling systems with 96 or 384 such syringes in a common array. Non-disposable liquid handling devices have the benefit that it is not necessary to pick
30 up and dispose of tips, however this advantage is to a large part negated by the need to wash the syringes between additions to avoid cross-contamination between samples. The need to perform this wash step means that liquid handling systems that use non-disposable syringes have
35 throughputs that are generally comparable to systems using disposable tips, and can be slower if several washes are required. The choice between disposable tips and re-usable

syringes is usually made on economic grounds or on the absolute requirement to eliminate cross-contamination. Re-usable syringes are perceived to be cheaper to run than disposable tips. Current disposable tips are expensive because of the need to provide these in a rack. When considering the true running cost of systems using non-disposable syringes it is important to take account of the cost of buying and disposing of the washing solvent and the cost of frequently replacing the syringe seals. In some cases, particularly in DNA amplification, it is necessary to guarantee zero cross-contamination even to the single molecule level. This can never be guaranteed with any system that relies on washing between transfers.

A common drawback with all currently existing multi-channel parallel pipetting systems is that each pipette cannot be individually addressed. Thus it is not possible when using, for example, a 96-pipettor array to add a reagent to all 96 wells of a microplate and then to add a second reagent to a chosen sub-set of the 96 wells with the same pipettor array. Even if the pistons in a 96 syringe array could be driven independently, it would still be necessary to immerse all 96 needles in the plate from which a sample was being transferred, thus leading to the possibility of wastage or carry-over.

The present invention provides a liquid handling system in which the pipettes may be disposable or re-usable and where the requirement to pick tips from a rack is eliminated. Furthermore, the present invention offers a means of high-speed sample transfer in a system that has full addressability for the pipette array. The system is compatible with low cost disposable devices.

According to the invention there is provided a strip of sampling devices comprising:

a strip of flexible material

an array of sampling devices joined to the strip to form a bandolier.

The flexible strip may have sprocket holes to drive and align the sampling devices. The devices may be of a positive displacement type having a barrel and piston, or may be of an air displacement type having a barrel (typically a cylindrical capillary or conical plastic tip) open at both ends or may be a sampling pin. It may be arranged so that all of the devices are held in the same plane and a hinged region is provided at each device to allow single or multiple devices to be hinged away from the general plane of the strip and thus be made available selectively.

The strip may be constructed of any suitable single or combination of materials such as plastic, paper or metal. The sampling device may be constructed of any suitable single or combination of materials such as plastics material, elastomer, metal, glass or ceramic. Alternatively, the sampling device and strip may be of unitary construction in a single material (preferably plastics material).

According to the present invention, there is also provided a method of substance sampling and dispensing, the method comprising the steps of:

feeding a strip, on which sampling devices are mounted, from a supply reel to an aspirate/dispense head;

positioning one or more of the sampling devices ready for sampling;

taking a sample;

dispensing the sample; and

feeding the used sampling device to a waste container.

The method may be performed with two or more aspirate/dispense heads at one time.

Plural aspirate/dispense heads may be used in sequence so that multiple aspirations and multiple dispenses may be supported.

According to the present invention, there is further provided a substance sampling and dispensing system comprising:

an aspirate/dispense head;

a supply reel for feeding to the aspirate/dispense head a continuous strip on which one or more sampling devices are mounted; and

5 positioning means for positioning the one or more sampling devices ready for sampling individually or in parallel.

The system may comprise a reel or stuffing box to accept used sampling devices.

10 The system may comprise further aspirate/dispense heads for receiving the strip prior to dispensing a sample.

The invention has particular benefits. A prior art pipetting apparatus will typically pick a pipette tip from a rack of tips, perform an aspiration at one location and
15 dispense liquid to another before ejecting the tip to take a fresh one. The tips are located in different positions in a rack, typically 96 at a time. The robot has to be programmed for each tip position and the tips must be accurately positioned. This is difficult and problems can
20 be experienced in tip pick and drop. The number of tips that can be accessed by the robot is limited to the number which can be accommodated in the area within the robots reach. The speed of pipetting is limited by the distance that the robot has to travel, the need for positional
25 accuracy and the need to accelerate and stop a heavy robot.

The method and apparatus of the present invention solves these problems. The sampling apparatus can be fed continuously with fresh sampling devices from a remote reel. A fresh sampling device is fed automatically to an
30 aspirate/ dispense head and is positioned to take a sample. The sampling device strip is always in contact with the robotic system, eliminating alignment problems. The need to travel to a tip rack position is eliminated, as is the capacity limitation dictated by the apparatus operating
35 envelope. As the sampling device strip has very low mass it can be accelerated, moved and stopped much faster than

a robot leaving the aspirate and dispense heads having only to travel short distances.

Furthermore, the method of the invention may be applied across many actuators (aspiration and dispense) with the sampling device strip running between them. After the first aspiration, the full sampling device then leaves the aspirate head and travels to a dispense head where an aliquot of the sample is dispensed. The sampling device may then continue on to further dispense heads to dispense further aliquots, and then on to a waste reel. This process enables one-to-many and many-to-one reformatting at high speed.

This system provides the benefits listed above when operating the method of the invention. The system has the ability to select an array of any number of sampling devices from 1 to the maximum number of sampling devices the head can address which allows for the process of 'cherry picking'. Conventional multi-channel liquid handling systems present the whole array of sampling devices at once into the sample. It is therefore not possible with, for example a 384-way syringe array (of the Tomtec or Robbins Scientific type) to pick a single compound from a 384-well plate. This process is important in follow-up for drug discovery. The present invention allows for a single sampling device or any number of sampling devices to be 'selected' by moving it through 90 degrees from the plane of the strip, thus allowing individual samples to be taken.

One example of the present invention will now be described with reference to the accompanying drawings, in which:

Figure 1 shows an array of sampling devices joined to a backing strip;

Figure 2 is a perspective view of a number of sampling devices selectably addressed for use;

Figure 3 is a diagrammatic view of a two-head liquid handling system according to the invention; and

Figure 4 is a perspective view of the two-head liquid handling system of figure 3.

Referring to figure 1, an array of sampling devices 1 (in this case positive displacement pipettes) is joined to a backing strip 2 at a defined pitch (in this case 4.5 mm to match 384 and 1536-well plates). Sprocket holes 5 are provided to drive the tape. A hinge region 3 is incorporated into the backing strip 2 to allow each pipette 1 to be folded through ninety degrees to the plane of the backing strip. Figure 2 illustrates the benefit of this hinge region and motion. The strip is held flat above a target microplate. By rotating the pipette tips through ninety degrees about the hinge region 3 only the selected tips can access wells in the plate, and furthermore the rear of each pipette 6 is made more accessible to an actuator.

As shown in Figure 3, an actuator 14 can grip the back of the pistons 6 to operate the positive displacement pipette 1. Or, if the pipettes are of the air displacement type, an array of nozzles 11 may be brought down to mate with the rear of the pipettes 1.

In this example, any number of pipettes 1 may be selected for operation. The pipettor heads 7,8 may be continuously supplied with pipettes 1 from a reel 12 some distance from the pipettor. A single pipettor head 7 may be used for both aspiration and dispense. In this case the invention gives the advantages of an essentially unlimited supply of pipette tips and the elimination of the need to travel to a location to pick or discard tips. Further benefits are obtained by using multiple pipettor heads 7,8. Figures 3 and 4 show two heads being used. A first head 7 selects pipettes and aspirates a liquid from wells in a microplate 9 into those pipettes. The filled pipettes 13 then travel on to the second head 8, which again selects the pipettes and then delivers part or all of their contents to a continuous tape of wells 10. This may alternatively be a microplate. In this way, the heavy

mechanical components are only required to move up and down. The low mass pipettes travel at speed between the heads.

5 A sampling device tape with a continuous series of
sampling devices on a 4.5-mm pitch can be used to access
one row of 16 wells of a 384-well plate at once. By
selecting alternate sampling devices, the same tape could
access 8 wells of a 96-well plate (9mm pitch) and so on.
10 This ability to temporarily orientate individual components
is not a feature found in other systems using bandoliered
components such as resistors, capacitors and bullets.

CLAIMS

1. A method of substance sampling and dispensing, the method comprising the steps of:

5 feeding a strip, on which sampling devices are mounted, from a supply reel to an aspirate/dispense head; positioning one or more of the sampling devices ready for sampling;

taking a sample;

10 dispensing the sample; and

feeding the used sampling device to a waste container.

2. A method according to claim 1, performed two or more aspirate/dispense heads such that sampling devices aspirate
15 samples at one head and then travel to a subsequent head to perform further aspiration or dispensing.

3. An array of sampling devices comprising:
a strip of flexible material
20 an array of sampling devices joined to the strip to form a bandolier.

4. An array according to claim 3, wherein a hinge region is incorporated in the strip to allow some or all of the
25 sampling devices to be folded away from the plane of the strip or other sampling devices or the strip.

5. An array according to any of the preceding claims 3 or 4, wherein sprocket holes are incorporated in the strip to
30 facilitate drive and indexing of the strip.

6. An array according to any of claims 3 to 5, wherein the body of each sampling device is used as a gear track to facilitate drive and indexing of the strip.

7. An array according to any of claims 3 to 6 wherein the sampling devices are positive displacement pipettes.

8. An array according to any of claims 3 to 6, wherein
5 the sampling devices are air displacement pipette tips.

9. An array according to any of claims 3 to 6, wherein the sampling devices are capillaries.

10 10. An array according to any of claims 3 to 6, wherein the sampling devices are sampling pins.

11. A substance sampling and dispensing system comprising:
an aspirate/dispense head;
15 an array according to any of claims 3 to 10; and
positioning means for positioning the one or more
sampling devices ready for sampling individually or in
parallel.

20 12. A system according to claim 11, further comprising an actuator to fold, in use sampling devices away from the plane of the strip or other sampling devices on the strip.

13. A system according to claim 11 or 12, further
25 comprising an actuator for selecting, in use one or more
sampling devices at will from the array.

14. A system according to any of claims 11 to 13, further
comprising at least one more actuator to aspirate or
30 dispense samples from the same sampling devices.

15. A system according to any of claims 11 to 14, wherein the strip of sampling devices is fed from a reel or fan-fold box.

16. A device according to any of claims 11 to 15, wherein the strip of used sampling devices are fed to a waste container or reel.

Figure 1

1/4

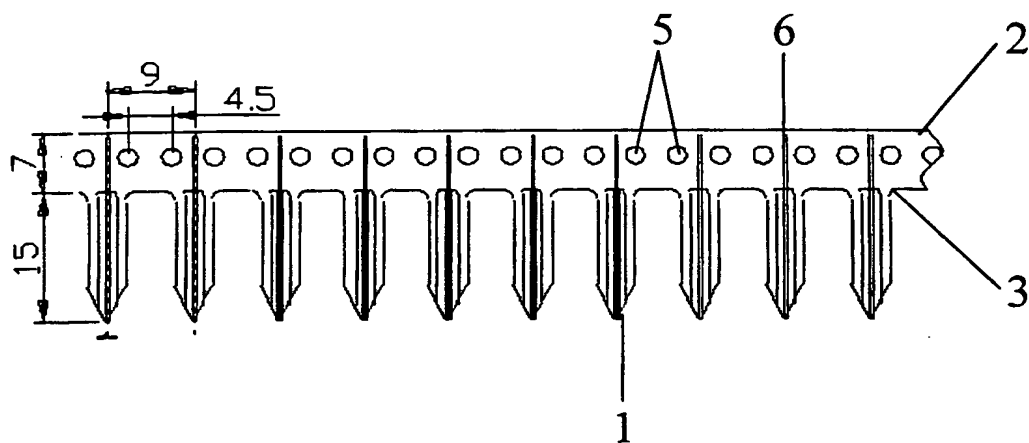


Figure 2

2/4

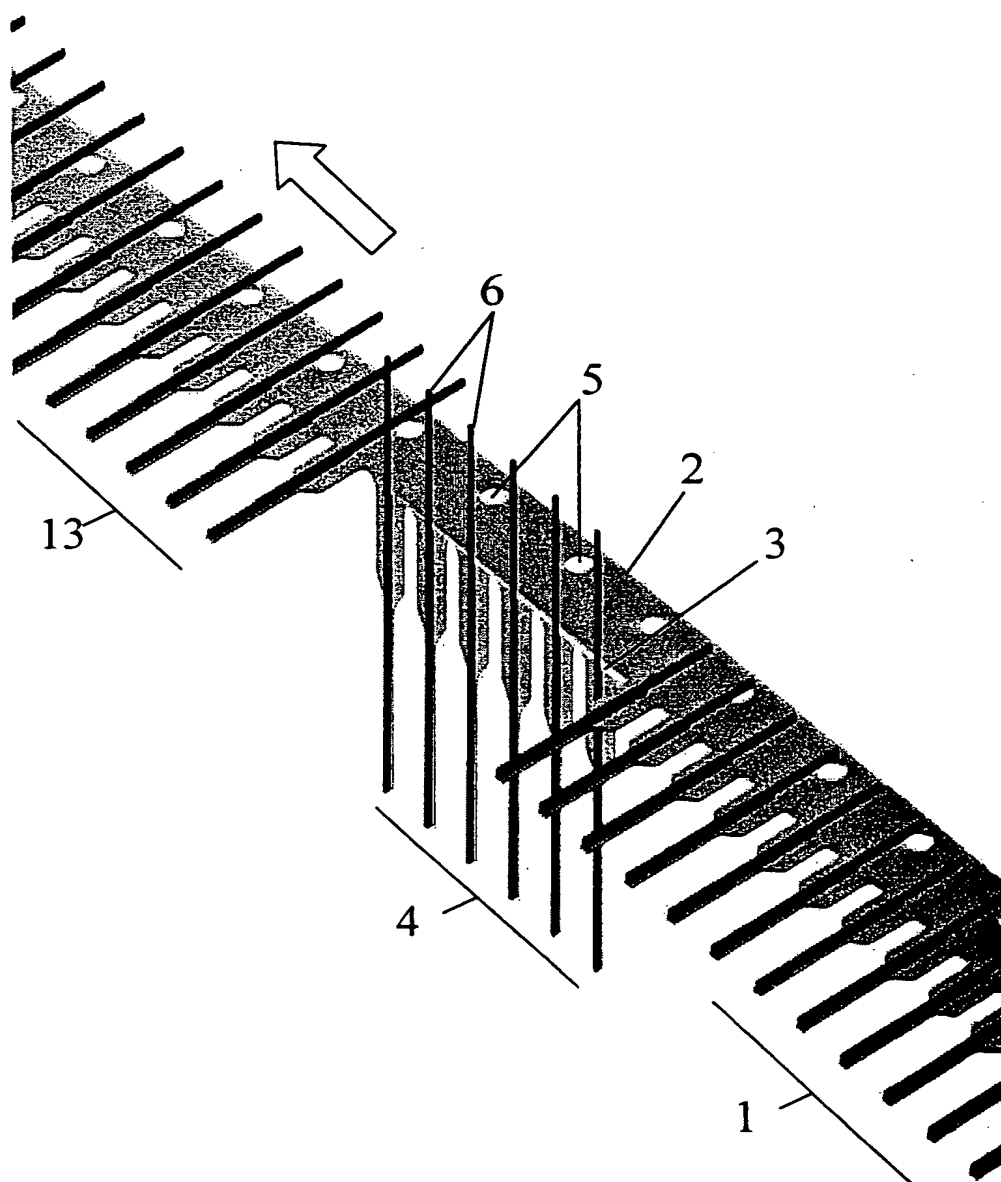
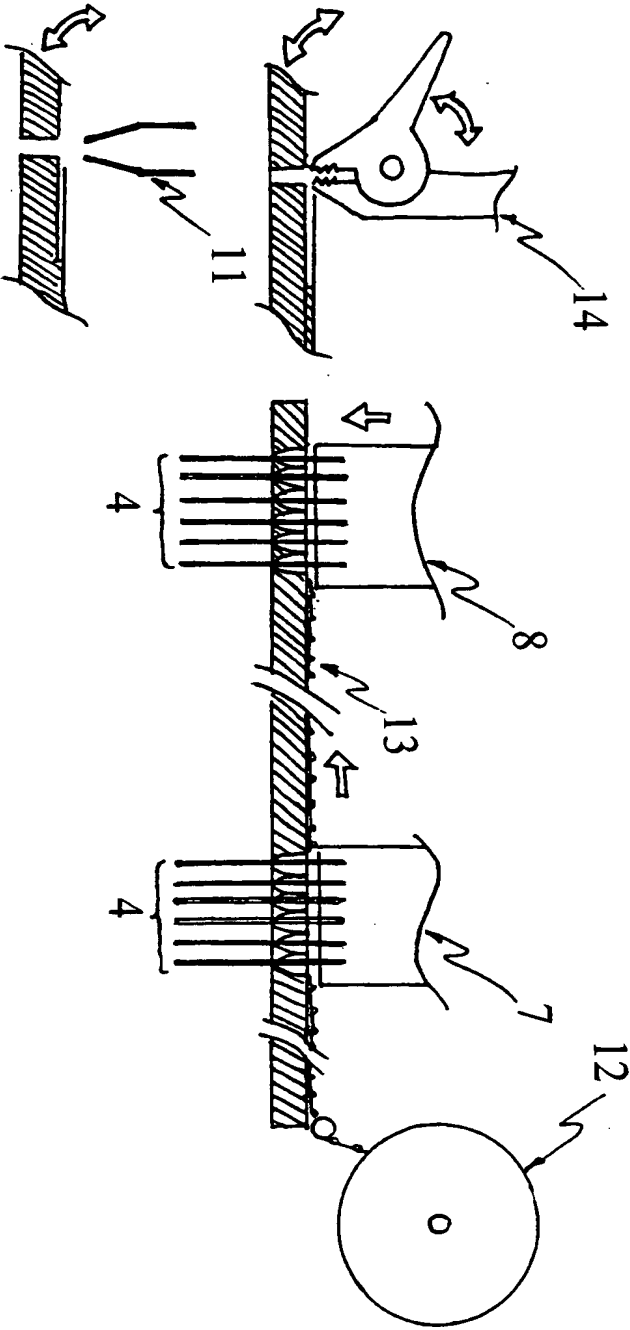


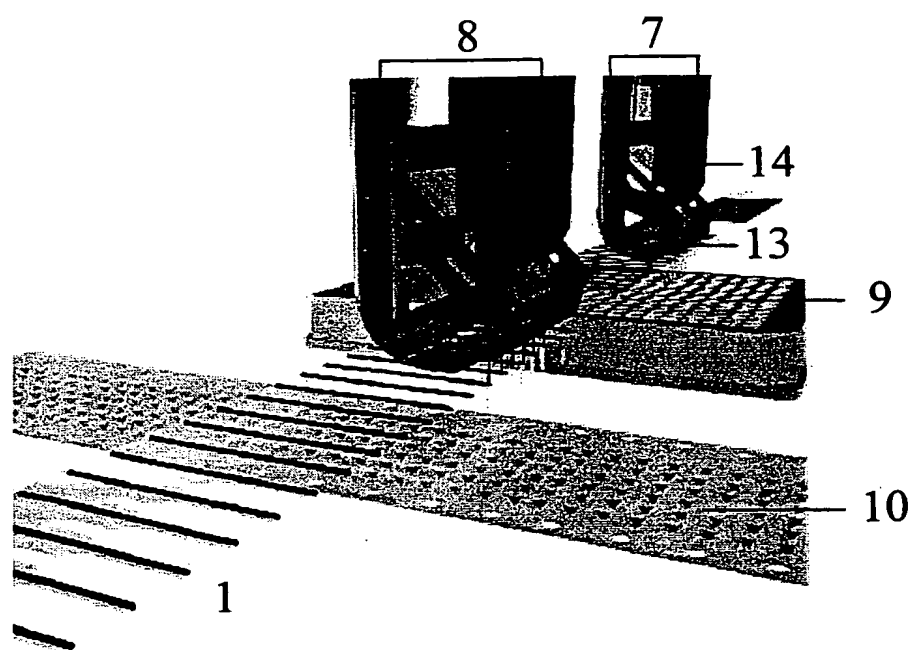
Figure 3

3/4



4/4

Figure 4



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INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference SAH01457W0	FOR FURTHER ACTION see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.	
International application No. PCT/GB 00/ 03145	International filing date (day/month/year) 15/08/2000	(Earliest) Priority Date (day/month/year) 17/08/1999
Applicant THE TECHNOLOGY PARTNERSHIP PLC		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 3 sheets.



It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the report

- a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.



the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

- b. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international search was carried out on the basis of the sequence listing :



contained in the international application in written form.



filed together with the international application in computer readable form.



furnished subsequently to this Authority in written form.



furnished subsequently to this Authority in computer readable form.



the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.



the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

2. ☐ **Certain claims were found unsearchable** (See Box I).

3. ☐ **Unity of invention is lacking** (see Box II).

4. With regard to the **title**,

the text is approved as submitted by the applicant.



the text has been established by this Authority to read as follows:

FLEXIBLE PIPETTE STRIP AND METHOD OF ITS USE

5. With regard to the **abstract**,

the text is approved as submitted by the applicant.



the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the **drawings** to be published with the abstract is Figure No.



as suggested by the applicant.



because the applicant failed to suggest a figure.



because this figure better characterizes the invention.

7



None of the figures.

INTERNATIONAL SEARCH REPORT

International Application No

PCT/GB 00/03145

A. CLASSIFICATION OF SUBJECT MATTER
 IPC 7 B01L3/02 //A61M5/31, B01J19/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 B01L A61M G01N B01J C12Q

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DE 198 43 691 A (SORENSEN BIOSCIENCE INC) 29 April 1999 (1999-04-29)	3,11
Y	column 3, line 58 -column 4, line 15 column 4, line 33 -column 4, line 42 column 5, line 37 -column 6, line 57 column 7, line 37 -column 7, line 52 figures 1-4 claim 7	5-7,10
Y	----- claim 7	5-7
Y	EP 0 226 867 A (HAMILTON BONADUZ AG) 1 July 1987 (1987-07-01)	5-7
A	page 4, line 2 -page 14, line 12 figures 1-10 ----- -/--	1,2

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search

27 October 2000

Date of mailing of the international search report

06/11/2000

Name and mailing address of the ISA

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Authorized officer

Koch, A

INTERNATIONAL SEARCH REPORT

International Application No

PCT/GB 00/03145

C. (Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	WO 99 34214 A (TABONE JOHN C ;GARRISON LORI K (US); RAPIGENE INC (US); NESS JEFFR) 8 July 1999 (1999-07-08) page 10, line 18 -page 14, line 6 figures 1-6 ---	10
A	GB 2 249 172 A (N PROIZV OB BIOLOG PRIBOROSTRO) 29 April 1992 (1992-04-29) page 4, line 9 -page 6, line 24 figures 1,2 -----	1-4

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/GB 00/03145

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
DE 19843691 A	29-04-1999	US 6103198 A CA 2247988 A FR 2769246 A GB 2329599 A	15-08-2000 24-03-1999 09-04-1999 31-03-1999
EP 0226867 A	01-07-1987	CH 671526 A AT 74539 T CA 1321985 A DE 3684767 A ES 2030656 T JP 2528297 B JP 62191049 A US 4967604 A US 4830832 A	15-09-1989 15-04-1992 07-09-1993 14-05-1992 16-11-1992 28-08-1996 21-08-1987 06-11-1990 16-05-1989
WO 9934214 A	08-07-1999	AU 2098999 A EP 1040352 A	19-07-1999 04-10-2000
GB 2249172 A	29-04-1992	FR 2668390 A	30-04-1992

PATENT COOPERATION TREATY

REC'D 25 OCT 2001

WIPO PCT

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference SAH01457WO	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/GB00/03145	International filing date (day/month/year) 15/08/2000	Priority date (day/month/year) 17/08/1999
International Patent Classification (IPC) or national classification and IPC B01L3/02		
Applicant THE TECHNOLOGY PARTNERSHIP PLC et al.		



- This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
- This REPORT consists of a total of 5 sheets, including this cover sheet.

☐ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of sheets.

- This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☒ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand 05/03/2001	Date of completion of this report 23.10.2001
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized officer de Lange, H Telephone No. +49 89 2399 8179 

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/GB00/03145

I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

Description, pages:

1-8 as originally filed

Claims, No.:

1-16 as originally filed

Drawings, sheets:

1/4-4/4 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☐ the claims, Nos.:

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/GB00/03145

☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	1-16
	No:	Claims	
Inventive step (IS)	Yes:	Claims	1-16
	No:	Claims	
Industrial applicability (IA)	Yes:	Claims	1-16
	No:	Claims	

2. Citations and explanations
see separate sheet

VII. Certain defects in the international application

The following defects in the form or contents of the international application have been noted:
see separate sheet

Re Item V

Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Claim 1 concerns a method of substance sampling and dispensing, in which the sampling devices are mounted on a strip of flexible material and are fed from a supply reel.
2. By applying this strip of flexible material and a reel feeding system, the problem is solved to transfer samples at a higher speed without picking the sample devices from a rack.
3. In the art as represented in the search report, a number of sampling and dispensing methods are disclosed. However in none of these documents a strip of flexible material in combination with a reel feeding system is disclosed. Accordingly claim 1 fulfills the requirements of Article 33(3) PCT. The industrial applicability of the sampling method is self evident.
4. Document D1 (DE 198 43 691 A) discloses an array of sampling devices (see figure 1 and the abstract) comprising a strip of flexible material and an array of sampling devices joined to the strip (see column 6, lines 27-30). This array of sampling devices forms however no "bandolier". Especially this feature forms the essential part of the invention, since by this feature the problem can be solved to more rapidly picking the sampling devices, since the devices need no longer to be placed in a rack.
5. So contrary to the opinion in the search report, current claim 3 fulfills the requirements of Article 33(2) PCT. Since none of the documents, cited in the search report disclose or suggest a bandolier type of strip and since the industrial applicability is self explanatory, this claim also fulfills the requirements of Article 33(3) and 33(4) PCT.
6. The claims 2 and 4-16 are dependent on claims 1 and 3 respectively. These claims present more specific embodiments and as such also fulfills the requirements of Article 33 PCT.

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/<APPL>

Re Item VII

Certain defects in the international application

1. The features of the claims are not provided with reference signs placed in parentheses (Rule 6.2(b) PCT).

PCT

REQUEST

The undersigned requests that the present international application be processed according to the Patent Cooperation Treaty.

For receiving Office use only

International Application No.

International Filing Date

Name of receiving Office and "PCT International Application"

Applicant's or agent's file reference
(if desired)(12 characters maximum) SAH01457WO

Box No. I TITLE OF INVENTION
Substance Handling System

Box No. II APPLICANT

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)

The Technology Partnership plc
Melbourn Science Park
Cambridge Road
Melbourn, Royston
Herts
SG8 6EE
United Kingdom

☒ This person is also inventor.

Telephone No.

Facsimile No.

Teleprinter No.

State (that is, country) of nationality: British

State (that is, country) of residence: United Kingdom

This person is applicant for the purposes of: ☐ all designated States ☒ all designated States except the United States of America ☐ the United States of America only ☐ the States indicated in the Supplemental Box

Box No. III FURTHER APPLICANTS AND/OR (FURTHER) INVENTORS

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)

John CASSELLS
C/o The Technology Partnership plc
Melbourn Science Park
Cambridge Road
Melbourn, Royston
Herts SG8 6EE
United Kingdom

This person is:

☐ applicant only

☒ applicant and inventor

☐ inventor only (if this check-box is marked, do not fill in below.)

State (that is, country) of nationality: British

State (that is, country) of residence: United Kingdom

This person is applicant for the purposes of: ☐ all designated States ☐ all designated States except the United States of America ☒ the United States of America only ☐ the States indicated in the Supplemental Box

☒ Further applicants and/or (further) inventors are indicated on a continuation sheet.

Box No. IV AGENT OR COMMON REPRESENTATIVE; OR ADDRESS FOR CORRESPONDENCE

The person identified below is hereby/has been appointed to act on behalf of the applicant(s) before the competent International Authorities as: ☒ agent ☐ common representative

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)

Gill Jennings & Every
Broadgate House
7 Eldon Street
London
EC2M 7LH
United Kingdom

Telephone No.

+44 20 7377 1377

Facsimile No.

+44 20 7377 1310

Teleprinter No.

(051) 22765 GILPAT G

☐ Address for correspondence: Mark this check-box where no agent or common representative is/has been appointed and the space above is used instead to indicate a special address to which correspondence should be sent.

Continuation of Box No. III FURTHER APPLICANT(S) AND/OR (FURTHER) INVENTOR(S)

If none of the following sub-boxes is used, this sheet is not to be included in the request.

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)

EDWARDS, Thomas Richard Kerby
7 Leys Walk
Hauxton
Cambridge
CB2 5HZ
United Kingdom

This person is:

- ☐ applicant only
☒ applicant and inventor
☐ inventor only (if this check-box is marked, do not fill in below.)

State (that is, country) of nationality:

British

State (that is, country) of residence:

United Kingdom

This person is applicant for the purposes of:

- ☐ all designated States ☐ all designated States except the United States of America ☒ the United States of America only ☐ the States indicated in the Supplemental Box

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)

WITHERS, Michael John
17 Highfield Road
Cambridge
CB4 9PF
United Kingdom

This person is:

- ☐ applicant only
☒ applicant and inventor
☐ inventor only (if this check-box is marked, do not fill in below.)

State (that is, country) of nationality:

British

State (that is, country) of residence:

United Kingdom

This person is applicant for the purposes of:

- ☐ all designated States ☐ all designated States except the United States of America ☒ the United States of America only ☐ the States indicated in the Supplemental Box

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)

LONG, James
30 Lonsdale
Linton
Cambridge
CB1 6LT
United Kingdom

This person is:

- ☐ applicant only
☒ applicant and inventor
☐ inventor only (if this check-box is marked, do not fill in below.)

State (that is, country) of nationality:

British

State (that is, country) of residence:

United Kingdom

This person is applicant for the purposes of:

- ☐ all designated States ☐ all designated States except the United States of America ☒ the United States of America only ☐ the States indicated in the Supplemental Box

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)

This person is:

- ☐ applicant only
☐ applicant and inventor
☐ inventor only (if this check-box is marked, do not fill in below.)

State (that is, country) of nationality:

State (that is, country) of residence:

This person is applicant for the purposes of:

- ☐ all designated States ☐ all designated States except the United States of America ☐ the United States of America only ☐ the States indicated in the Supplemental Box

☐ Further applicants and/or (further) inventors are indicated on another continuation sheet.

Box V DESIGNATION OF STATES

The following designations are hereby made under Rule 4.9(a) (mark the applicable check-boxes; at least one must be marked):

Regional Patent

- ☒ **AP** **ARIPO Patent:** GH Ghana, GM Gambia, KE Kenya, LS Lesotho, MW Malawi, MZ Mozambique, SD Sudan, SL Sierra Leone, SZ Swaziland, TZ United Republic of Tanzania, UG Uganda, ZW Zimbabwe, and any other State which is a Contracting State of the Harare Protocol and of the PCT
- ☒ **EA** **Eurasian Patent:** AM Armenia, AZ Azerbaijan, BY Belarus, KG Kyrgyzstan, KZ Kazakhstan, MD Republic of Moldova, RU Russian Federation, TJ Tajikistan, TM Turkmenistan, and any other State which is a Contracting State of the Eurasian Patent Convention and of the PCT
- ☒ **EP** **European Patent:** AT Austria, BE Belgium, CH and LI Switzerland and Liechtenstein, CY Cyprus, DE Germany, DK Denmark, ES Spain, FI Finland, FR France, GB United Kingdom, GR Greece, IE Ireland, IT Italy, LU Luxembourg, MC Monaco, NL Netherlands, PT Portugal, SE Sweden, and any other State which is a Contracting State of the European Patent Convention and of the PCT
- ☒ **OA** **OAPI Patent:** BF Burkina Faso, BJ Benin, CF Central African Republic, CG Congo, CI Côte d'Ivoire, CM Cameroon, GA Gabon, GN Guinea, GW Guinea-Bissau, ML Mali, MR Mauritania, NE Niger, SN Senegal, TD Chad, TG Togo, and any other State which is a member State of OAPI and a Contracting State of the PCT (if other kind of protection or treatment desired, specify on dotted line)

National Patent (if other kind of protection or treatment desired, specify on dotted line):

- | | |
|---|---|
| <input checked="" type="checkbox"/> AE United Arab Emirates | <input checked="" type="checkbox"/> LC Saint Lucia |
| <input checked="" type="checkbox"/> AG Antigua and Barbuda | <input checked="" type="checkbox"/> LK Sri Lanka |
| <input checked="" type="checkbox"/> AL Albania | <input checked="" type="checkbox"/> LR Liberia |
| <input checked="" type="checkbox"/> AM Armenia | <input checked="" type="checkbox"/> LS Lesotho |
| <input checked="" type="checkbox"/> AT Austria | <input checked="" type="checkbox"/> LT Lithuania |
| <input checked="" type="checkbox"/> AU Australia | <input checked="" type="checkbox"/> LU Luxembourg |
| <input checked="" type="checkbox"/> AZ Azerbaijan | <input checked="" type="checkbox"/> LV Latvia |
| <input checked="" type="checkbox"/> BA Bosnia & Herzegovina | <input checked="" type="checkbox"/> MA Morocco |
| <input checked="" type="checkbox"/> BB Barbados | <input checked="" type="checkbox"/> MD Republic of Moldova |
| <input checked="" type="checkbox"/> BG Bulgaria | <input checked="" type="checkbox"/> MG Madagascar |
| <input checked="" type="checkbox"/> BR Brazil | <input checked="" type="checkbox"/> MK The former Yugoslav Republic of Macedonia |
| <input checked="" type="checkbox"/> BY Belarus | <input checked="" type="checkbox"/> MN Mongolia |
| <input checked="" type="checkbox"/> BZ Belize | <input checked="" type="checkbox"/> MW Malawi |
| <input checked="" type="checkbox"/> CA Canada | <input checked="" type="checkbox"/> MX Mexico |
| <input checked="" type="checkbox"/> CH and LI Switzerland and Liechtenstein | <input checked="" type="checkbox"/> MZ Mozambique |
| <input checked="" type="checkbox"/> CN China | <input checked="" type="checkbox"/> NO Norway |
| <input checked="" type="checkbox"/> CR Costa Rica | <input checked="" type="checkbox"/> NZ New Zealand |
| <input checked="" type="checkbox"/> CU Cuba | <input checked="" type="checkbox"/> PL Poland |
| <input checked="" type="checkbox"/> CZ Czech Republic | <input checked="" type="checkbox"/> PT Portugal |
| <input checked="" type="checkbox"/> DE Germany | <input checked="" type="checkbox"/> RO Romania |
| <input checked="" type="checkbox"/> DK Denmark | <input checked="" type="checkbox"/> RU Russian Federation |
| <input checked="" type="checkbox"/> DM Dominica | <input checked="" type="checkbox"/> SD Sudan |
| <input checked="" type="checkbox"/> DZ Algeria | <input checked="" type="checkbox"/> SE Sweden |
| <input checked="" type="checkbox"/> EE Estonia | <input checked="" type="checkbox"/> SG Singapore |
| <input checked="" type="checkbox"/> ES Spain | <input checked="" type="checkbox"/> SI Slovenia |
| <input checked="" type="checkbox"/> FI Finland | <input checked="" type="checkbox"/> SK Slovakia |
| <input checked="" type="checkbox"/> GB United Kingdom | <input checked="" type="checkbox"/> SL Sierra Leone |
| <input checked="" type="checkbox"/> GD Grenada | <input checked="" type="checkbox"/> TJ Tajikistan |
| <input checked="" type="checkbox"/> GE Georgia | <input checked="" type="checkbox"/> TM Turkmenistan |
| <input checked="" type="checkbox"/> GH Ghana | <input checked="" type="checkbox"/> TR Turkey |
| <input checked="" type="checkbox"/> GM Gambia | <input checked="" type="checkbox"/> TT Trinidad and Tobago |
| <input checked="" type="checkbox"/> HR Croatia | <input checked="" type="checkbox"/> TZ United Republic of Tanzania |
| <input checked="" type="checkbox"/> HU Hungary | <input checked="" type="checkbox"/> UA Ukraine |
| <input checked="" type="checkbox"/> ID Indonesia | <input checked="" type="checkbox"/> UG Uganda |
| <input checked="" type="checkbox"/> IL Israel | <input checked="" type="checkbox"/> US United States of America |
| <input checked="" type="checkbox"/> IN India | <input checked="" type="checkbox"/> UZ Uzbekistan |
| <input checked="" type="checkbox"/> IS Iceland | <input checked="" type="checkbox"/> VN Viet Nam |
| <input checked="" type="checkbox"/> JP Japan | <input checked="" type="checkbox"/> YU Yugoslavia |
| <input checked="" type="checkbox"/> KE Kenya | <input checked="" type="checkbox"/> ZA South Africa |
| <input checked="" type="checkbox"/> KG Kyrgyzstan | <input checked="" type="checkbox"/> ZW Zimbabwe |
| <input checked="" type="checkbox"/> KP Democratic People's Republic of Korea | |
| <input checked="" type="checkbox"/> KR Republic of Korea | |
| <input checked="" type="checkbox"/> KZ Kazakhstan | |

Check-boxes reserved for designating States which have become party to the PCT after issuance of this sheet:

- ☐
- ☐

Precautionary Designation Statement: In addition to the designations made above, the applicant also makes under Rule 4.9(b) all other designations which would be permitted under the PCT except any designation(s) indicated in the Supplemental Box as being excluded from the scope of this statement. The applicant declares that those additional designations are subject to confirmation and that any designation which is not confirmed before the expiration of 15 months from the priority date is to be regarded as withdrawn by the applicant at the expiration of that time limit. (Confirmation (including fees) must reach the receiving Office within the 15-month time limit.)

1. Date of actual receipt of the purported international application:		2. Drawings: <input type="checkbox"/> received: <input type="checkbox"/> not received:
3. Corrected date of actual receipt due to later but timely received papers or drawings completing the purported international application:		
4. Date of timely receipt of the required corrections under PCT Article 11(2):		
5. International Searching Authority (if two or more are competent): ISA/	6. <input type="checkbox"/> Transmittal of search copy delayed until search fee is paid	

For International Bureau use only

PATENT COOPERATION TREATY

PCT

From the INTERNATIONAL BUREAU

NOTIFICATION CONCERNING
SUBMISSION OR TRANSMITTAL
OF PRIORITY DOCUMENT

(PCT Administrative Instructions, Section 411)

To:

GILL JENNINGS & EVERY
Broadgate House
7 Eldon Street
London EC2M 7LH
ROYAUME-UNI

Date of mailing (day/month/year) 21 December 2000 (21.12.00)	IMPORTANT NOTIFICATION
Applicant's or agent's file reference SAH01457WO	
International application No. PCT/GB00/03145	International filing date (day/month/year) 15 August 2000 (15.08.00)
International publication date (day/month/year) Not yet published	Priority date (day/month/year) 17 August 1999 (17.08.99)
Applicant THE TECHNOLOGY PARTNERSHIP PLC et al	

- The applicant is hereby notified of the date of receipt (except where the letters "NR" appear in the right-hand column) by the International Bureau of the priority document(s) relating to the earlier application(s) indicated below. Unless otherwise indicated by an asterisk appearing next to a date of receipt, or by the letters "NR", in the right-hand column, the priority document concerned was submitted or transmitted to the International Bureau in compliance with Rule 17.1(a) or (b).
- This updates and replaces any previously issued notification concerning submission or transmittal of priority documents.
- An asterisk(*) appearing next to a date of receipt, in the right-hand column, denotes a priority document submitted or transmitted to the International Bureau but not in compliance with Rule 17.1(a) or (b). In such a case, **the attention of the applicant is directed** to Rule 17.1(c) which provides that no designated Office may disregard the priority claim concerned before giving the applicant an opportunity, upon entry into the national phase, to furnish the priority document within a time limit which is reasonable under the circumstances.
- The letters "NR" appearing in the right-hand column denote a priority document which was not received by the International Bureau or which the applicant did not request the receiving Office to prepare and transmit to the International Bureau, as provided by Rule 17.1(a) or (b), respectively. In such a case, **the attention of the applicant is directed** to Rule 17.1(c) which provides that no designated Office may disregard the priority claim concerned before giving the applicant an opportunity, upon entry into the national phase, to furnish the priority document within a time limit which is reasonable under the circumstances.

<u>Priority date</u>	<u>Priority application No.</u>	<u>Country or regional Office or PCT receiving Office</u>	<u>Date of receipt of priority document</u>
17 Augu 1999 (17.08.99)	99306463.3	EP	13 Dece 2000 (13.12.00)

The International Bureau of WIPO
34, chemin des Colombettes
1211 Geneva 20, Switzerland

Facsimile No. (41-22) 740.14.35

Authorized officer

Athina Nickitas-Etienne

Telephone No. (41-22) 338.83.38

PATENT COOPERATION TREATY

PCT

NOTICE INFORMING THE APPLICANT OF THE
COMMUNICATION OF THE INTERNATIONAL
APPLICATION TO THE DESIGNATED OFFICES

(PCT Rule 47.1(c), first sentence)

From the INTERNATIONAL BUREAU

To:

GILL JENNINGS & EVERY
Broadgate House
7 Eldon Street
London EC2M 7LH
ROYAUME-UNI

Date of mailing (day/month/year) 22 February 2001 (22.02.01)		
Applicant's or agent's file reference SAH01457WO		IMPORTANT NOTICE
International application No. PCT/GB00/03145	International filing date (day/month/year) 15 August 2000 (15.08.00)	Priority date (day/month/year) 17 August 1999 (17.08.99)
Applicant THE TECHNOLOGY PARTNERSHIP PLC et al		

1. Notice is hereby given that the International Bureau has communicated, as provided in Article 20, the international application to the following designated Offices on the date indicated above as the date of mailing of this Notice:
AU,KP,KR,US

In accordance with Rule 47.1(c), third sentence, those Offices will accept the present Notice as conclusive evidence that the communication of the international application has duly taken place on the date of mailing indicated above and no copy of the international application is required to be furnished by the applicant to the designated Office(s).

2. The following designated Offices have waived the requirement for such a communication at this time:

AE,AG,AL,AM,AP,AT,AZ,BA,BB,BG,BR,BY,BZ,CA,CH,CN,CR,CU,CZ,DE,DK,DM,DZ,EA,EE,EP,ES,
FI,GB,GD,GE,GH,GM,HR,HU,ID,IL,IN,IS,JP,KE,KG,KZ,LC,LK,LR,LS,LT,LU,LV,MA,MD,MG,MK,
MN,MW,MX,MZ,NO,NZ,OA,PL,PT,RO,RU,SD,SE,SG,SI,SK,SL,TJ,TM,TR,TT,TZ,UA,UG,UZ,VN,YU,
The communication will be made to those Offices only upon their request. Furthermore, those Offices do not require the applicant to furnish a copy of the international application (Rule 49.1(a-bis)).

3. Enclosed with this Notice is a copy of the international application as published by the International Bureau on
22 February 2001 (22.02.01) under No. WO 01/12330

REMINDER REGARDING CHAPTER II (Article 31(2)(a) and Rule 54.2)

If the applicant wishes to postpone entry into the national phase until 30 months (or later in some Offices) from the priority date, a demand for international preliminary examination must be filed with the competent International Preliminary Examining Authority before the expiration of 19 months from the priority date.

It is the applicant's sole responsibility to monitor the 19-month time limit.

Note that only an applicant who is a national or resident of a PCT Contracting State which is bound by Chapter II has the right to file a demand for international preliminary examination.

REMINDER REGARDING ENTRY INTO THE NATIONAL PHASE (Article 22 or 39(1))

If the applicant wishes to proceed with the international application in the national phase, he must, within 20 months or 30 months, or later in some Offices, perform the acts referred to therein before each designated or elected Office.

For further important information on the time limits and acts to be performed for entering the national phase, see the Annex to Form PCT/IB/301 (Notification of Receipt of Record Copy) and Volume II of the PCT Applicant's Guide.

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland	Authorized officer J. Zahra
Facsimile No. (41-22) 740.14.35	Telephone No. (41-22) 338.83.38

The demand must be filed directly with the competent International Preliminary Examining Authority or, if two or more Authorities are competent, with the one chosen by the applicant. The full name or two-letter code of that Authority may be indicated by the applicant on the line below:

IPEA/ _____

PCT

CHAPTER II

DEMAND

under Article 31 of the Patent Cooperation Treaty:

The undersigned requests that the international application specified below be the subject of international preliminary examination according to the Patent Cooperation Treaty and hereby elects all eligible States (except where otherwise indicated).

For International Preliminary Examining Authority use only	
Identification of IPEA	Date of receipt of DEMAND
Box No. I IDENTIFICATION OF THE INTERNATIONAL APPLICATION	
Applicant's or agent's file reference SAH01457WO	
International application No. PCT/GB00/03145	International filing date (day/month/year) 15/08/00
(Earliest) Priority date (day/month/year) 17/08/99	
Title of invention Substance Handling System	
Box No. II APPLICANT(S)	
Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)	
The Technology Partnership plc Melbourn Science Park Cambridge Road Melbourn, Royston Herts, SG8 6EE United Kingdom	
Telephone No.:	
Facsimile No.:	
Teleprinter No.:	
State (that is, country) of nationality: British	State (that is, country) of residence: United Kingdom
Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)	
CASSELLS, John c/o The Technology Partnership Melbourn Science Park Cambridge Road Melbourn, Royston Herts SG8 6EE	
State (that is, country) of nationality: British	State (that is, country) of residence: United Kingdom
Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)	
EDWARDS, Thomas Richard Kelly 7 Leys Walk Hauxton Cambridge CB2 5HZ United Kingdom	
State (that is, country) of nationality: British	State (that is, country) of residence: United Kingdom
<input checked="" type="checkbox"/> Further applicants are indicated on a continuation sheet.	

Sheet No.

International application No.

PCT/GB00/03145

Continuation of Box No. II APPLICANT(S)

If none of the following sub-boxes is used, this sheet should not be included in the demand.

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)

WITHERS, Michael John
17 Highfield Road
Cambridge
CB4 9PF
United Kingdom

State (that is, country) of nationality:

British

State (that is, country) of residence:

United Kingdom

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)

LONG, James
40 Lonsdale
Linton
Cambridge
CB1 6LT
United Kingdom

State (that is, country) of nationality:

British

State (that is, country) of residence:

United Kingdom

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)

State (that is, country) of nationality:

State (that is, country) of residence:

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)

State (that is, country) of nationality:

State (that is, country) of residence:

☐

Further applicants are indicated on another continuation sheet.

Box No. III AGENT OR COMMON REPRESENTATIVE; OR ADDRESS FOR CORRESPONDENCEThe following person is ☒ agent ☐ common representativeand ☒ has been appointed earlier and represents the applicant(s) also for international preliminary examination.☐ is hereby appointed and any earlier appointment of (an) agent(s)/common representative is hereby revoked.☐ is hereby appointed, specifically for the procedure before the International Preliminary Examining Authority, in addition to the agent(s)/common representative appointed earlier.Name and address: *(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)*Gill Jennings & Every
Broadgate House
7 Eldon Street
London
EC2M 7LH
United Kingdom

Telephone No.:

+44 171 377 1377

Facsimile No.:

+44 171 377 1310

Teleprinter No.:

☐ Address for correspondence: Mark this check-box where no agent or common representative is/has been appointed and the space above is used instead to indicate a special address to which correspondence should be sent.**Box No. IV BASIS FOR INTERNATIONAL PRELIMINARY EXAMINATION****Statement concerning amendments: ***

1. The applicant wishes the international preliminary examination to start on the basis of:

☒ the international application as originally filed

the description

☐ as originally filed☐ as amended under Article 34

the claims

☐ as originally filed☐ as amended under Article 19 (together with any accompanying statement)☐ as amended under Article 34

the drawings

☐ as originally filed☐ as amended under Article 342. ☐ The applicant wishes any amendment to the claims under Article 19 to be considered as reversed.3. ☐ The applicant wishes the start of the international preliminary examination to be postponed until the expiration of 20 months from the priority date unless the International Preliminary Examining Authority receives a copy of any amendments made under Article 19 or a notice from the applicant that he does not wish to make such amendments (Rule 69.1(d)). *(This check-box may be marked only where the time limit under Article 19 has not yet expired.)*

* Where no check-box is marked, international preliminary examination will start on the basis of the international application as originally filed or, where a copy of amendments to the claims under Article 19 and/or amendments of the international application under Article 34 are received by the International Preliminary Examining Authority before it has begun to draw up a written opinion or the international preliminary examination report, as so amended.

Language for the purposes of international preliminary examination: English☐ which is the language in which the international application was filed.☐ which is the language of a translation furnished for the purposes of international search.☐ which is the language of publication of the international application.☐ which is the language of the translation (to be) furnished for the purposes of international preliminary examination.**Box No. V ELECTION OF STATES**The applicant hereby elects all eligible States *(that is, all States which have been designated and which are bound by Chapter II of the PCT)*

excluding the following States which the applicant wishes not to elect:

Box No. VI CHECK LIST

The demand is accompanied by the following elements, in the language referred to in Box No. IV, for the purposes of international preliminary examination:

- | | | |
|--|---|--------|
| 1. translation of international application | : | sheets |
| 2. amendments under Article 34 | : | sheets |
| 3. copy (or, where required, translation) of amendments under Article 19 | : | sheets |
| 4. copy (or, where required, translation) of statement under Article 19 | : | sheets |
| 5. letter | : | sheets |
| 6. other (<i>specify</i>) | : | sheets |

For International Preliminary
Examining Authority use only

received not received

<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>

The demand is also accompanied by the item(s) marked below:

- | | |
|--|---|
| 1. <input type="checkbox"/> fee calculation sheet | 4. <input type="checkbox"/> statement explaining lack of signature |
| 2. <input type="checkbox"/> separate signed power of attorney | 5. <input type="checkbox"/> nucleotide and or amino acid sequence listing in computer readable form |
| 3. <input type="checkbox"/> copy of general power of attorney; reference number, if any: | 6. <input type="checkbox"/> other (<i>specify</i>): |

Box No. VII SIGNATURE OF APPLICANT, AGENT OR COMMON REPRESENTATIVE

Next to each signature, indicate the name of the person signing and the capacity in which the person signs (if such capacity is not obvious from reading the demand).

For the Applicant
Gill Jennings & Every

HALEY, Stephen

Date: 2 March 2001

For International Preliminary Examining Authority use only

1. Date of actual receipt of DEMAND:

2. Adjusted date of receipt of demand due to CORRECTIONS under Rule 60.1(b):

3. ☐ The date of receipt of the demand is AFTER the expiration of 19 months from the priority date and item 4 or 5, below, does not apply.

☐ The applicant has been informed accordingly.

4. ☐ The date of receipt of the demand is WITHIN the period of 19 months from the priority date as extended by virtue of Rule 80.5.

5. ☐ Although the date of receipt of the demand is after the expiration of 19 months from the priority date, the delay in arrival is EXCUSED pursuant to Rule 82.

For International Bureau use only

Demand received from IPEA on:

PATENT COOPERATION TREATY

PCT

From the
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

To:

HALEY, Stephen
GILL JENNINGS & EVERY
Broadgate House
7 Eldon Street
London EC2M 7LH
GRANDE BRETAGNE

RECEIVED

26 MAR 2001

NOTIFICATION OF RECEIPT OF DEMAND BY COMPETENT INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

(PCT Rules 59.3(e) and 61.1(b), first sentence
and Administrative Instructions, Section 601(a))

Date of mailing
(day/month/year)

23. 03. 01

Applicant's or agent's file reference
SAH01457WO

GILL JENNINGS & EVERY

IMPORTANT NOTIFICATION

International application No.

PCT/GB 00/ 03145

International filing date (day/month/year)

15/08/2000

Priority date (day/month/year)

17/08/1999

Applicant

THE TECHNOLOGY PARTNERSHIP PLC

1. The applicant is hereby notified that this International Preliminary Examining Authority considers the following date as the date of receipt of the demand for international preliminary examination of the international application:

05/03/2001

2. This date of receipt is:

- ☒ the actual date of receipt of the demand by this Authority (Rule 61.1(b)).
- ☐ the actual date of receipt of the demand on behalf of this Authority (Rule 59.3(e)).
- ☐ the date on which this Authority has, in response to the invitation to correct defects in the demand (Form PCT/IPEA/404), received the required corrections.

3. ☐ **ATTENTION:** That date of receipt is **AFTER** the expiration of 19 months from the priority date. Consequently, the election(s) made in the demand does (do) not have the effect of postponing the entry into the national phase until 30 months from the priority date (or later in some Offices) (Article 39(1)). Therefore, the acts for entry into the national phase must be performed within 20 months from the priority date (or later in some Offices) (Article 22). For details, see the *PCT Applicant's Guide*, Volume II.

+ IPEA/401 ; 2 corrected pages

- ☐ (If applicable) This notification confirms the information given by telephone, facsimile transmission or in person on:

4. Only where paragraph 3 applies, a copy of this notification has been sent to the International Bureau.

Name and mailing address of the IPEA/



European Patent Office
D-80298 Munich
Tel. (+49-89) 2399-0, Tx: 523656 epmu d
Fax: (+49-89) 2399-4465

Authorized officer

FALCO M

Tel. (+49-89) 2399-7276

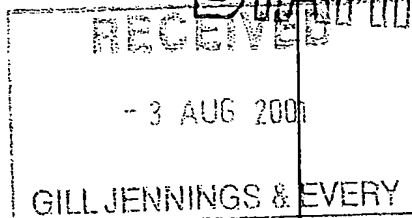


Due: 1.10.01
PATENT COOPERATION TREATY

From the:
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

To:

HALEY, Stephen
GILL JENNINGS & EVERY
Broadgate House
7 Eldon Street
London EC2M 7LH
GRANDE BRETAGNE



PCT

WRITTEN OPINION

(PCT Rule 66)

Date of mailing (day/month/year)		01.08.2001
Applicant's or agent's file reference SAH01457WO		REPLY DUE within 2 month(s) from the above date of mailing
International application No. PCT/GB00/03145	International filing date (day/month/year) 15/08/2000	Priority date (day/month/year) 17/08/1999
International Patent Classification (IPC) or both national classification and IPC B01L3/02		
Applicant THE TECHNOLOGY PARTNERSHIP PLC et al.		



- This written opinion is the **first** drawn up by this International Preliminary Examining Authority.
- This opinion contains indications relating to the following items:
 - ☒ Basis of the opinion
 - ☐ Priority
 - ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
 - ☐ Lack of unity of invention
 - ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
 - ☐ Certain document cited
 - ☒ Certain defects in the international application
 - ☒ Certain observations on the international application
- The applicant is hereby **invited to reply** to this opinion.

When? See the time limit indicated above. The applicant may, before the expiration of that time limit, request this Authority to grant an extension, see Rule 66.2(d).

How? By submitting a written reply, accompanied, where appropriate, by amendments, according to Rule 66.3. For the form and the language of the amendments, see Rules 66.8 and 66.9.

Also: For an additional opportunity to submit amendments, see Rule 66.4.
For the examiner's obligation to consider amendments and/or arguments, see Rule 66.4 bis.
For an informal communication with the examiner, see Rule 66.6.

If no reply is filed, the international preliminary examination report will be established on the basis of this opinion.
- The final date by which the international preliminary examination report must be established according to Rule 69.2 is: 17/12/2001.

Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized officer / Examiner de Lange, H	
	Formalities officer (incl. extension of time limits) Fuerbass, C Telephone No. +49 89 2399 8132	

WRITTEN OPINION

International application No. PCT/GB00/03145

I. Basis of the opinion

1. With regard to the **elements** of the international application (Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this opinion as "originally filed"):

Description, pages:

1-8 as originally filed

Claims, No.:

1-16 as originally filed

Drawings, sheets:

1/4-4/4 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☐ the claims, Nos.:

WRITTEN OPINION

International application No. PCT/GB00/03145

☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

V. Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

- | | |
|-------------------------------|----------------|
| 1. Statement | |
| Novelty (N) | Claims 3;No |
| Inventive step (IS) | Claims 5-14;No |
| Industrial applicability (IA) | Claims |

2. Citations and explanations
see separate sheet

VII. Certain defects in the international application

The following defects in the form or contents of the international application have been noted:
see separate sheet

VIII. Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:
see separate sheet

Re Item V

Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Claim 1 concerns a method of substance sampling and dispensing, in which the sampling devices are mounted on a strip of flexible material and are fed from a supply reel.
2. By applying this strip of flexible material and a reel feeding system, the problem is solved to transfer samples at a higher speed without the need of picking the sample devices from a rack.
3. In the art, a number of sampling and dispensing methods are disclosed. However none of the documents, cited in the search report discloses or fairly suggests a strip of flexible material that is fed by a reel feeding system. The industrial applicability of the sampling method is self evident, accordingly claim 1 fulfills the requirements of Article 33 PCT.
4. Document D1 (DE 198 43 691 A) discloses an array of sampling devices (see figure 1 and the abstract) comprising a strip of flexible material and an array of sampling devices joined to the strip (see column 6, lines 27-30). Furthermore, this array of sampling devices is judged to fall under the definition of the word "bandolier". Accordingly, claim 3 is not novel over document D1 and thus the requirements of Article 33(2) PCT are not met.
5. If the applicant can give a clear and sound proof that the array of sampling heads, described in D1 cannot be considered to fall under the definition of a "bandolier", he is kindly requested to do so and preferably to file a document as proof.
6. Else, claim 3 should be amended, so that it becomes more distinct from the art, especially from the D1. Care should be taken not to violate Article 34(2)b, i.e. that the amendments do not go beyond the scope of the application as filed.
7. It appears that the essential aspect of current application is the ability of the array of sampling devices to be stored on a reel, as defined in the method claim 1.

Since none of the documents, cited in the search report disclose or fairly suggests to present such an array of sampling devices, it appears that an amended claim, having a feature that corresponds with the ability to be stored on a reel, fulfills the requirements of Article 33 PCT.

8. Claim 2 is dependent on claims 1 and presents more specific embodiments and as such also fulfills the requirements of Article 33 PCT.
9. Claim 4 and 15 seems to define a features that cannot be found in the art, the claims 5-14 seems to give more specific embodiments that are either known in, or easily derivable from the art.

Re Item VII

Certain defects in the international application

1. The features of the claims are not provided with reference signs placed in parentheses (Rule 6.2(b) PCT).

Re Item VIII

Certain observations on the international application

1. It is not clear what exactly can be understood as a "bandolier", see under item V, 4&5 (Article 6 PCT).